

What is claimed:

1. A method for directing tissue-specific expression of a target gene in a plant,
5 comprising:
producing a plant from a transformed plant cell such that tissue-specific expression
of a target gene occurs within a selected tissue of the plant,
wherein the transformed plant cell comprises a target gene in operative linkage with a
brassica turgor gene-26 promoter element.
- 10 2. The method of claim 1, wherein the tissue-specific expression takes place in the
root or leaves of the plant.
3. A method for directing tissue-specific and environmental or developmentally-
15 regulated expression of a target gene in a plant, comprising:
producing a plant from a transformed plant cell such that tissue-specific and
environmentally or developmentally-regulated expression of a target gene occurs within
a selected tissue of the plant,
wherein the transformed plant cell comprises a target gene in operative linkage with a
20 brassica turgor gene-26 promoter element.
4. The method of claim 3, wherein the tissue-specific expression takes place in the
root or leaves of the plant and the environmental or developmentally-regulated
expression takes place under conditions of osmotic stress.
- 25 5. A method for directing fruit-specific expression of a target gene in a plant,
comprising:
producing a plant from a transformed plant cell such that fruit-specific
expression of a target gene occurs,
30 wherein the transformed plant cell comprises a target gene in operative linkage
with a genetic regulatory element which directs the fruit-specific expression of
the target gene.

6. The method of claim 5, wherein the target gene is selected from the group consisting of: genes encoding proteins involved in phytoremediation, genes encoding proteins involved in pesticide resistance, genes encoding proteins involved in resistance to stress, genes encoding structural proteins, genes encoding pharmaceutical proteins or enzymes which produce pharmaceutical compounds, genes encoding proteins involved in nutrient uptake or utilization, and genes encoding proteins involved in plant growth.

7. A method for directing root-specific expression of a target gene in a plant, comprising:

producing a plant from a transformed plant cell such that root-specific expression of a target gene occurs,

wherein the transformed plant cell comprises a target gene in operative linkage with a genetic regulatory element which directs the root-specific expression of the target gene.

8. The method of claim 7, wherein the target gene is selected from the group consisting of: genes encoding proteins which alter nutrient content, genes encoding proteins involved in phytoremediation, genes encoding proteins conferring pesticide resistance, genes encoding structural proteins, genes producing pharmaceutical proteins or enzymes which produce pharmaceutical compounds, genes encoding proteins involved in nutrient uptake or utilization, and genes encoding proteins involved in plant growth.

9. A method for directing seed-specific expression of a target gene in a plant, comprising:

producing a plant from a transformed plant cell such that seed-specific expression of a target gene occurs,

wherein the transformed plant cell comprises a target gene in operative linkage with a genetic regulatory element which directs the seed-specific expression of the target gene.

10. The method of claim 9, wherein the target gene is selected from the group consisting of: genes encoding proteins involved in phytoremediation, genes encoding proteins conferring pesticide resistance, genes encoding proteins involved in

the appearance of the plant, genes encoding proteins involved in stress resistance, genes encoding structural proteins, genes encoding pharmaceutical proteins or enzymes which produce pharmaceutical compounds, genes encoding proteins involved in the uptake or utilization of nutrients, and genes encoding proteins involved in plant growth.

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11. A method for directing flower-specific expression of a target gene in a plant, comprising:

producing a plant from a transformed plant cell such that flower-specific expression of a target gene occurs,

10 wherein the transformed plant cell comprises a target gene in operative linkage with a genetic regulatory element which directs the flower-specific expression of the target gene.

12. The method of claim 11, wherein the target gene is selected from the
15 group consisting of: genes encoding proteins which impact nutrient content, genes encoding proteins involved in phytoremediation, genes encoding proteins involved in herbicide resistance, antisense genetic sequences, genes encoding proteins involved in pesticide resistance, genes encoding proteins involved in resistance to stress, genes encoding structural proteins, genes encoding pharmaceutical proteins or enzymes which
20 produce pharmaceutical compounds, and genes encoding proteins involved in nutrient uptake or utilization.

13. A method for directing tuber-specific expression of a target gene in a plant, comprising:

25 producing a plant from a transformed plant cell such that tuber-specific expression of a target gene occurs,

wherein the transformed plant cell comprises a target gene in operative linkage with a genetic regulatory element which directs the tuber-specific expression of the target gene.

30 14. The method of claim 13, wherein the target gene is selected from the group consisting of: genes encoding proteins involved in resistance to insects, nematodes, viruses, bacteria, or fungi, genes encoding proteins involved in

phytoremediation, genes encoding proteins involved in herbicide resistance, genes encoding proteins involved in pesticide resistance, genes encoding proteins involved in appearance, genes encoding proteins involved in stress resistance, genes encoding structural proteins, genes encoding pharmaceutical proteins or enzymes which produce pharmaceutical compounds, genes encoding proteins involved in nutrient uptake or utilization, and genes involved in plant growth.

15. A method for directing shoot-specific expression of a target gene in a plant, comprising:

10 producing a plant from a transformed plant cell such that shoot-specific expression of a target gene occurs, wherein the transformed plant cell comprises a target gene in operative linkage with a genetic regulatory element which directs the shoot-specific expression of the target gene.

15 16. The method of claim 15, wherein the target gene is selected from the group consisting of: genes encoding proteins which impact nutrient content, genes encoding proteins involved in phytoremediation, genes encoding proteins involved in herbicide resistance, genes encoding proteins involved in pesticide resistance, antisense genetic sequences, genes encoding proteins involved in appearance, genes encoding proteins involved in stress resistance, genes encoding structural proteins, genes encoding pharmaceutical proteins or enzymes which produce pharmaceutical compounds, genes encoding proteins involved in nutrient uptake or utilization, and genes involved in plant growth.

25 17. A method for directing vascular-specific expression of a target gene in a plant, comprising:

30 producing a plant from a transformed plant cell such that vascular-specific expression of a target gene occurs,

wherein the transformed plant cell comprises a target gene in operative linkage with a genetic regulatory element which directs the vascular-specific expression of the target gene.

5 18. The method of claim 17, wherein the target gene is selected from the group consisting of: genes encoding proteins involved in resistance to insects, nematodes, viruses, bacteria, or fungi, genes encoding proteins which impact nutrient content, genes encoding proteins involved in phytoremediation, genes encoding genes encoding proteins involved in herbicide resistance, genes encoding proteins involved in
10 pesticide resistance, antisense genetic sequences, genes encoding proteins involved in appearance, genes encoding proteins involved in stress resistance, genes encoding pharmaceutical proteins or enzymes which produce pharmaceutical compounds, genes encoding proteins involved in nutrient uptake or utilization, and genes involved in plant growth.

15 19. A method for directing meristem-specific expression of a target gene in a plant, comprising:
 producing a plant from a transformed plant cell such that meristem-specific
 expression of a target gene occurs,
20 wherein the transformed plant cell comprises a target gene in operative linkage with a genetic regulatory element which directs the meristem-specific expression of the target gene.

 20. The method of claim 19, wherein the target gene is selected from the
25 group consisting of: genes encoding proteins which impact nutrient content, genes encoding proteins involved in phytoremediation, genes encoding genes encoding proteins involved in herbicide resistance, genes encoding proteins involved in pesticide resistance, antisense genetic sequences, genes encoding proteins involved in appearance, genes encoding pharmaceutical proteins or enzymes which produce pharmaceutical
30 compounds, genes encoding proteins involved in nutrient uptake or utilization, and genes involved in plant growth.

21. A method for directing pollen-specific expression of a target gene in a plant, comprising:

producing a plant from a transformed plant cell such that pollen-specific expression of a target gene occurs,

5 wherein the transformed plant cell comprises a target gene in operative linkage with a genetic regulatory element which directs the pollen-specific expression of the target gene.

22. The method of claim 21, wherein the target gene is selected from the group consisting of: genes encoding proteins which impact nutrient content, genes encoding proteins involved in phytoremediation, genes encoding genes encoding proteins involved in herbicide resistance, genes encoding proteins involved in pesticide resistance, antisense genetic sequences, genes encoding proteins involved in appearance, genes encoding structural proteins, genes encoding proteins involved in stress resistance, genes encoding pharmaceutical proteins or enzymes which produce pharmaceutical compounds, genes encoding proteins involved in nutrient uptake or utilization, and genes involved in plant growth.

23. A method for directing ovule-specific expression of a target gene in a plant, comprising:

20 producing a plant from a transformed plant cell such that ovule-specific expression of a target gene occurs,

wherein the transformed plant cell comprises a target gene in operative linkage with a genetic regulatory element which directs the ovule-specific expression of the target

25 gene.

24. The method of claim 23, wherein the target gene is selected from the group consisting of: genes encoding proteins involved in resistance to insects, nematodes, viruses, bacteria, or fungi, genes encoding proteins involved in phytoremediation, genes encoding genes encoding proteins involved in herbicide resistance, genes encoding proteins involved in pesticide resistance, antisense genetic sequences, genes encoding proteins involved in appearance, genes encoding structural

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proteins, genes encoding proteins involved in stress resistance, genes encoding pharmaceutical proteins or enzymes which produce pharmaceutical compounds, genes encoding proteins involved in nutrient uptake or utilization, and genes involved in plant growth.

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25. The method of claim 5, wherein expression of the target gene is further environmentally or developmentally regulated.

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26. The method of claim 7, wherein expression of the target gene is further environmentally or developmentally regulated.

27. The method of claim 9, wherein expression of the target gene is further environmentally or developmentally regulated.

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28. The method of claim 11, wherein expression of the target gene is further environmentally or developmentally regulated.

29. The method of claim 13, wherein expression of the target gene is further environmentally or developmentally regulated.

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30. The method of claim 15, wherein expression of the target gene is further environmentally or developmentally regulated.

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31. The method of claim 17, wherein expression of the target gene is further environmentally or developmentally regulated.

32. The method of claim 19, wherein expression of the target gene is further environmentally or developmentally regulated.

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33. The method of claim 21, wherein expression of the target gene is further environmentally or developmentally regulated.

34. A seed comprising a gene in operative linkage with a genetic regulatory element which directs the fruit-specific expression of the target gene.

35. The seed of claim 34, wherein the target gene is selected from the group consisting of: genes encoding proteins involved in phytoremediation, genes encoding proteins involved in pesticide resistance, genes encoding proteins involved in resistance to stress, genes encoding structural proteins, genes encoding pharmaceutical proteins or enzymes which produce pharmaceutical compounds, genes encoding proteins involved in nutrient uptake or utilization, and genes encoding proteins involved in plant growth.

36. The seed of claim 34, wherein expression of the target gene is further environmentally or developmentally regulated.

37. A seed comprising a gene in operative linkage with a genetic regulatory element which directs the root-specific expression of the target gene.

38. The seed of claim 37, wherein the target gene is selected from the group consisting of: genes encoding proteins which alter nutrient content, genes encoding proteins involved in phytoremediation, genes encoding proteins conferring pesticide resistance, genes encoding structural proteins, genes producing pharmaceutical proteins or enzymes which produce pharmaceutical compounds, genes encoding proteins involved in nutrient uptake or utilization, and genes encoding proteins involved in plant growth.

39. The seed of claim 37, wherein expression of the target gene is further environmentally or developmentally regulated.

40. A seed comprising a gene in operative linkage with a genetic regulatory element which directs the seed-specific expression of the target gene.

41. The seed of claim 40, wherein the target gene is selected from the group consisting of: genes encoding proteins involved in phytoremediation, genes encoding

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proteins conferring pesticide resistance, genes encoding proteins involved in the appearance of the plant, genes encoding proteins involved in stress resistance, genes encoding structural proteins, genes encoding pharmaceutical proteins or enzymes which produce pharmaceutical compounds, genes encoding proteins involved in the uptake or
5 utilization of nutrients, and genes encoding proteins involved in plant growth.

42. The seed of claim 40, wherein expression of the target gene is further environmentally or developmentally regulated.

10 43. A seed comprising a gene in operative linkage with a genetic regulatory element which directs the flower-specific expression of the target gene.

44. The seed of claim 43, wherein the target gene is selected from the group consisting of: genes encoding proteins which impact nutrient content, genes encoding
15 proteins involved in phytoremediation, genes encoding proteins involved in herbicide resistance, antisense genetic sequences, genes encoding proteins involved in pesticide resistance, genes encoding proteins involved in resistance to stress, genes encoding structural proteins, genes encoding pharmaceutical proteins or enzymes which produce pharmaceutical compounds, and genes encoding proteins involved in nutrient uptake or
20 utilization.

45. The seed of claim 43, wherein expression of the target gene is further environmentally or developmentally regulated.

25 46. A seed comprising a gene in operative linkage with a genetic regulatory element which directs the tuber-specific expression of the target gene.

47. The seed of claim 46, wherein the target gene is selected from the group consisting of: genes encoding proteins involved in resistance to insects, nematodes,
30 viruses, bacteria, or fungi, genes encoding proteins involved in phytoremediation, genes encoding genes encoding proteins involved in herbicide resistance, genes encoding proteins involved in pesticide resistance, genes encoding proteins involved in

appearance, genes encoding proteins involved in stress resistance, genes encoding structural proteins, genes encoding pharmaceutical proteins or enzymes which produce pharmaceutical compounds, genes encoding proteins involved in nutrient uptake or utilization, and genes involved in plant growth.

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48. The seed of claim 46, wherein expression of the target gene is further environmentally or developmentally regulated.

49. A seed comprising a gene in operative linkage with a genetic regulatory
10 element which directs the shoot-specific expression of the target gene.

50. The seed of claim 49, wherein the target gene is selected from the group consisting of: genes encoding proteins which impact nutrient content, genes encoding proteins involved in phytoremediation, genes encoding genes encoding proteins
15 involved in herbicide resistance, genes encoding proteins involved in pesticide resistance, antisense genetic sequences, genes encoding proteins involved in appearance, genes encoding proteins involved in stress resistance, genes encoding structural proteins, genes encoding pharmaceutical proteins or enzymes which produce pharmaceutical compounds, genes encoding proteins involved in nutrient uptake or
20 utilization, and genes involved in plant growth.

51. The seed of claim 49, wherein expression of the target gene is further environmentally or developmentally regulated.

25 52. A seed comprising a gene in operative linkage with a genetic regulatory element which directs the vascular-specific expression of the target gene.

53. The seed of claim 52, wherein the target gene is selected from the group consisting of: genes encoding proteins involved in resistance to insects, nematodes,
30 viruses, bacteria, or fungi, genes encoding proteins which impact nutrient content, genes encoding proteins involved in phytoremediation, genes encoding genes encoding proteins involved in herbicide resistance, genes encoding proteins involved in pesticide

resistance, antisense genetic sequences, genes encoding proteins involved in appearance, genes encoding proteins involved in stress resistance, genes encoding pharmaceutical proteins or enzymes which produce pharmaceutical compounds, genes encoding proteins involved in nutrient uptake or utilization, and genes involved in plant growth.

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54. The seed of claim 52, wherein expression of the target gene is further environmentally or developmentally regulated.

55. A seed comprising a gene in operative linkage with a genetic regulatory
10 element which directs the meristem-specific expression of the target gene.

56. The seed of claim 55, wherein the target gene is selected from the group
consisting of: genes encoding proteins which impact nutrient content, genes encoding
proteins involved in phytoremediation, genes encoding genes encoding proteins
15 involved in herbicide resistance, genes encoding proteins involved in pesticide
resistance, antisense genetic sequences, genes encoding proteins involved in appearance,
genes encoding pharmaceutical proteins or enzymes which produce pharmaceutical
compounds, genes encoding proteins involved in nutrient uptake or utilization, and
genes involved in plant growth.

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57. The seed of claim 55, wherein expression of the target gene is further environmentally or developmentally regulated.

58. A seed comprising a gene in operative linkage with a genetic regulatory
25 element which directs the pollen-specific expression of the target gene.

59. The seed of claim 58, wherein the target gene is selected from the group
consisting of: genes encoding proteins which impact nutrient content, genes encoding
proteins involved in phytoremediation, genes encoding genes encoding proteins
30 involved in herbicide resistance, genes encoding proteins involved in pesticide
resistance, antisense genetic sequences, genes encoding proteins involved in appearance,
genes encoding structural proteins, genes encoding proteins involved in stress

resistance, genes encoding pharmaceutical proteins or enzymes which produce pharmaceutical compounds, genes encoding proteins involved in nutrient uptake or utilization, and genes involved in plant growth.

5 60. The seed of claim 58, wherein expression of the target gene is further environmentally or developmentally regulated.

 61. A seed comprising a gene in operative linkage with a genetic regulatory element which directs the ovule-specific expression of the target gene.

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 62. The seed of claim 61, wherein the target gene is selected from the group consisting of: genes encoding proteins involved in resistance to insects, nematodes, viruses, bacteria, or fungi, genes encoding proteins involved in phytoremediation, genes encoding genes encoding proteins involved in herbicide resistance, genes encoding
15 proteins involved in pesticide resistance, antisense genetic sequences, genes encoding proteins involved in appearance, genes encoding structural proteins, genes encoding proteins involved in stress resistance, genes encoding pharmaceutical proteins or enzymes which produce pharmaceutical compounds, genes encoding proteins involved in nutrient uptake or utilization, and genes involved in plant growth.

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 63. The seed of claim 61, wherein expression of the target gene is further environmentally or developmentally regulated.

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